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NOTES ON AMERICAN ENCHYTRAEIDÆ. I—NEW SPECIES OF FRIDERICIA FROM THE VICINITY OF PHILADELPHIA.

BY J. PERCY MOORE.

Five species of *Fridericia* have been collected in the neighborhood of Philadelphia, of which one is as yet insufficiently studied. Brief descriptions of the remaining four follow:

*Fridericia longa* n. s.

Length, 25–30 mm. Number of somites, 60–69.

Anterior to the clitellum the setæ number four to the bundle, the inner pair being two-thirds the length of the outer. Posterior to the clitellum the bundles are constituted of a single pair.

The spermathecæ (Plate XIII, figs. 4 and 5), are provided with from five to eight accessory sacs or diverticula. These are much smaller than the central sac, around the base of which they are arranged in a single whorl, and, in the younger worms at least, approximated in pairs. The central or primary sac is more or less cylindrical, with concave, (as in fig. 4) or convex sides, in which latter case it may be nearly spherical. The stalk or duct is slender, and two or three times the length of the expanded portion of the spermatheca; a few small unicellular glands cluster about its mouth.

A pair of simple salivary glands (pepto-nephridia) open into the œsophagus in the fifth somite. In the examples studied they were quite unbranched (Plate XIII, fig. 6).

Supra-œsophageal ganglion two-thirds as broad as long, convex behind.

The nephridia and heart were not studied.

*F. longa* has been met with in only one locality, where it was exceedingly plentiful during the month of April of this year. This spot is on a very dry bank by a roadside; the surface soil, in which the worms were found, is a thin layer of wood mould with a few scattered leaves which were not sufficient to prevent the ground from baking hard and dry. A later visit (in July) found the worms in very much reduced numbers and of smaller size. In movement and

somewhat in form this species recalls the nematodes. It possesses a greater number of somites than is usual in the genus, and reaches a larger size than any other *Fridericia* yet found in this region. The sides of the somites, and especially the whole surface of the prostomium, are plentifully studded with little rounded glandular knobs.

*Fridericia agricola* n. s.

This species has a length of 20–25 mm., and the mature worm 65 somites.

The setæ are normally arranged in fascicles of four to the thirtieth somite, posterior to which only two persist. Sometimes the number is respectively five or three owing to the retention of one seta of the larger outer pair for a greater length of time than its fellow. This occurs most frequently in the ventral bundles, and in the outer half of a bundle. The setæ of the lateral bundles average about one-tenth longer than those of the ventral. In normal bundles the setæ of the inner pair have a length of nearly two-thirds the outer.

The spermathecæ (Plate XIII, figs. 1, 2 and 3) are quite different from those of *F. longa*. The long, slender stalks are from six to seven times the length of the sacculated portion, and the whole organ proportionately much larger than in the other species herein described. The enlarged portion consists of a central thick-walled cylindrical region, capped by a thinner-walled, more or less conical piece, which at its apex opens into the œsophageal lumen. A single pair of accessory sacs arise opposite to each other from the base of the thick-walled region. These are of sub-spherical or sometimes more or less flattened shape, and when fully developed quite as large as the primary sac. They open into the latter by constricted mouths, and being thin-walled, have spacious cavities which are usually filled with spermatozoa, a bunch of which is likewise to be frequently found projecting into the lumen of the œsophagus. No glands are present at the mouth of the spermatheca.

The salivary glands (Plate XIII, fig. 7) are conspicuous, and each is divided into from five to seven slender tubular branches, which may themselves be simple or provided with one or two lateral twigs. The tubes are of very irregular diameter.

The supra-œsophageal ganglion is as in the last species.

The ante-septal portion of the nephridia is ovate; the post-septal slender, with a dorsal lobe about equaling in size the ante-septal.

The terminal duct passes forward nearly to the septum and then bends sharply backward to its external pore.

Prominent transverse slit-like dorsal pores begin on the somite VII.

These worms are slow and sluggish in movement, and rest most of the time coiled up more or less tightly. They are very plentiful in early spring about the lawns and meadows at Wayne, Delaware County, Pennsylvania, where they are found most frequently coiled up among the bulbous underground stems of garlic. Later during the summer they become very scarce, apparently dying off, as almost none could be found on digging to a depth of eighteen inches, and they did not reappear even when the ground was soaked by prolonged rains.

A variety of this species has the terminal portion of the spermatheca for a short distance from the mouth glandularly thickened, and one or two solid outgrowths alternating with the accessory sacs (Plate XIII, Fig. 3.)

*Fridericia parva* n. s.

This is the smallest species that I have found. Its length is 12–15 mm., and the number of somites 46.

Four setae constitute a bundle as far as the twenty-fifth somite, behind which there are only two.

The spermathecae (Plate XIII, fig. 10) are simple, the stalk being about four times the length of the sacs, with glandular aggregations at its base. There are no diverticula to the saccular region, which is broadly pyriform, and attached to the stalk by its broad end, the narrow end opening into the oesophagus.

Salivary glands (Plate XIII, fig. 9) simple and unbranched, with a bulbous dilatation at the mouth.

The dorsal vessel arises from the peri-enteric sinus in somite XVII.

The supra-oesophageal ganglion is oblong ovate, about three-fifths as broad as long, with its greatest width a little posterior to the middle of its length, and the posterior border very slightly emarginated. Ante-septal portion of nephridia about as long as principal part of post-septal (minus the terminal duct) and about one-half as thick.

Funnel of vas deferens broadly ovoidal, with a constricted mouth; duct much coiled and about 9–10 times the length of the funnel. Prostate gland flattened globoid.

The dorsal pores begin on somite VII, and are placed in each succeeding somite one-third of its length from the anterior end.

The larger peritoneal corpuscles are elliptical, with a few small oil drops of very regular size confined to a single circle close to the periphery.

*F. parva* is opaline white in color, and the prostomium is conspicuously roughened with rounded glandular nodules.

This species is rather common between fallen leaves in damp spots in the woods. July.

***Fridericia alba* n. s.**

Length, 15–22 mm. Number of somites, 56–58.

Setæ usually four per bundle, with the exception of two or three terminal somites, which have two. In certain of the ante-clitellar somites five, six, or even seven, setæ are sometimes present. The setæ of the inner pair in a bundle of four are about three-fourths, or over, the length of the outer. All setæ are rather long and slender.

The spermathecæ (Plate XIII, fig. 11) are almost exactly like those of the last species, the sac being simple, but rather more spherical, the stalk about four to five times its length, and without glands at its mouth.

The salivary glands (Plate XIII, fig. 8) are very slightly branched, with only two or three branches, and may possibly be sometimes simple.

The dorsal vessel arises in the twenty-second somite. The brain is nearly oblong and slightly emarginate behind. Dorsal pores begin on somite VI.

The nephridia have not been studied.

This is the most nearly aquatic of the four species, being found most plentifully in the wet moss and leaves along streams in the woods. Common at all seasons and the most generally distributed species.

The four species above described are easily distinguished from one another by the characters of the spermatheca and salivary gland alone, as follows:

<i>alba</i>	<i>longa</i>
<i>parva</i> Spermatheca	Salivary gland
simple	simple
<i>agricola</i> Salivary gland	Spermatheca
branched	with diverticula.

## DESCRIPTION OF PLATE XIII.

All figures are magnified 112 diameters.

Figs. 1-3. Spermathecæ of *Fridericia agricola*; 1, in optical section, showing at *s* a bundle of spermatozoa projecting into the œsophageal lumen; 2, a view of the base of the saccular region, and 3, the entire organ of a specimen of the variety mentioned in the text.

Figs. 4 and 5. Spermathecæ of two individuals of *F. longa* in lateral and basal views.

Fig. 6. Salivary gland of *F. longa*.

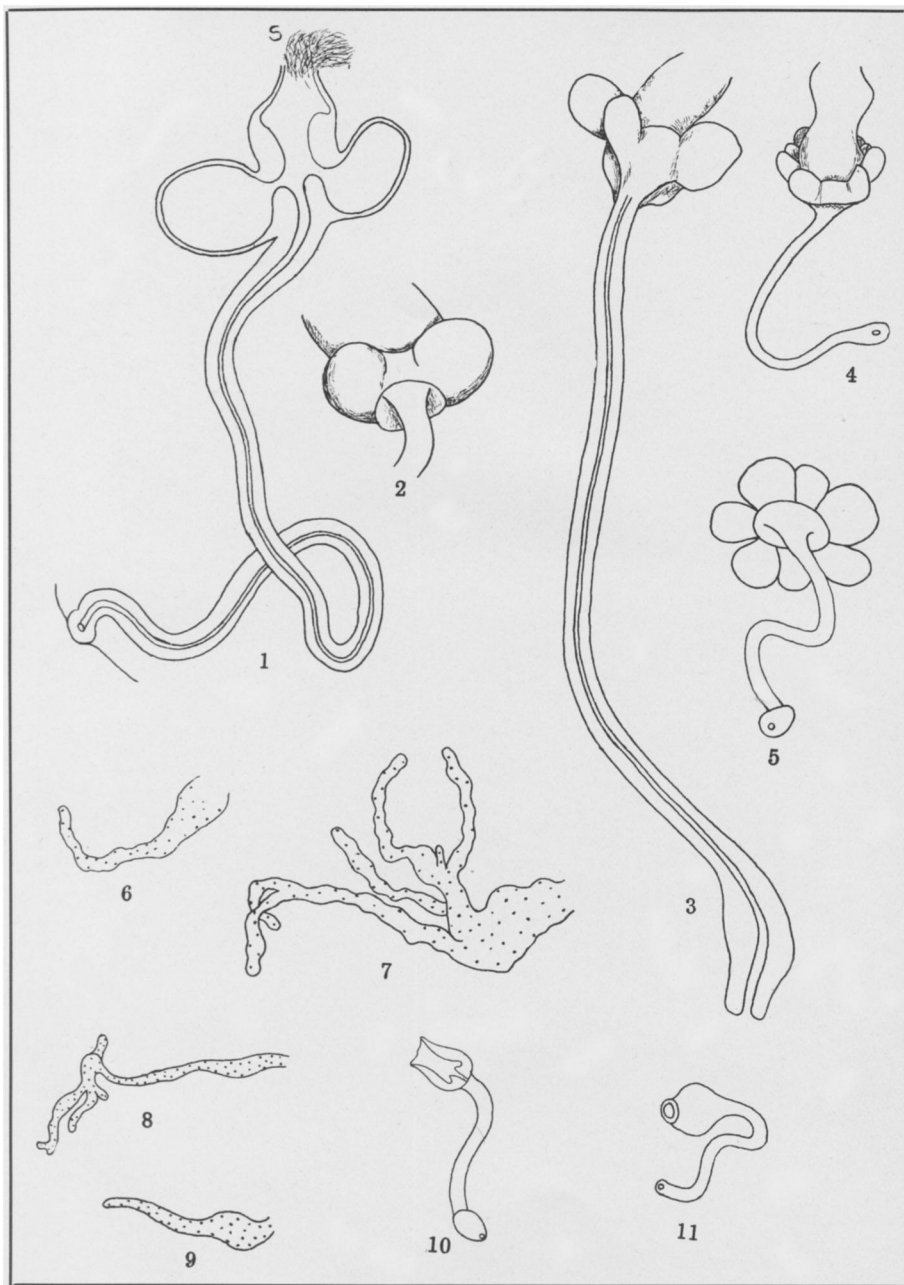
Fig. 7. " " " *F. agricola*.

Fig. 8. " " " *F. alba*.

Fig. 9. " " " *F. parva*.

Fig. 10. Spermatheca of *F. parva*.

Fig. 11. " " *F. alba*.



MOORE ON FRIDERICIA.